THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
MARINE RESOURCES OPERATIONS

REPORT FOR THE MONTH OF FEBRUARY 1963

ACCOMPLISHMENTS

The year-long survey of southern California sportfishing from piers and jetties started on schedule February 1. This survey is part of D-J project F20R which is designed to measure total ocean angler effort off southern California.

Field work began on the San Francisco Bay project, a joint program of the Delta Study and MRO.

A bluefin tagged last summer was found in the first catch made since October, bringing total recoveries to 86 out of 960 released. It obviously is practical to tag purse-seine caught fish.

The ALASKA found ocean shrimp relatively plentiful in Area C, catching an average of 800 pounds per hour. The area has not been particularly productive the last couple of years.

HIGHLIGHTS

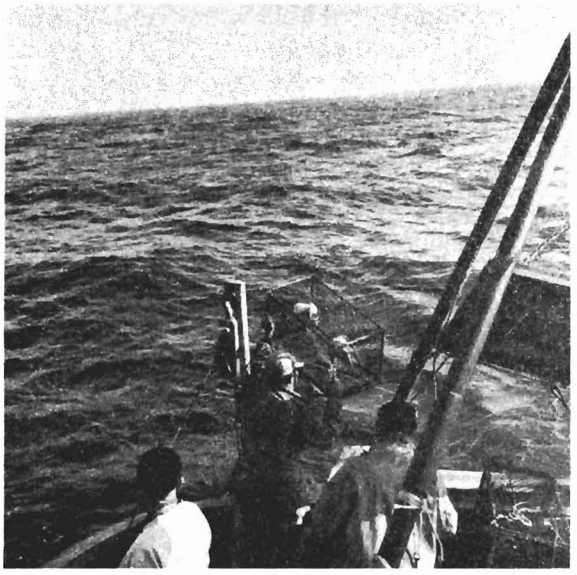
Ocean anglers in January, 11,000 strong, landed 20 percent more fish (107,000) than did 12,000 a year ago. Barracuda catches were way above 1962, and kelp bass substantially so; halibut dropped by half.

Red tide again is extensive in both central and southern California. No dieoffs have occurred to our knowledge since that in Alamitos Bay during October 1962.

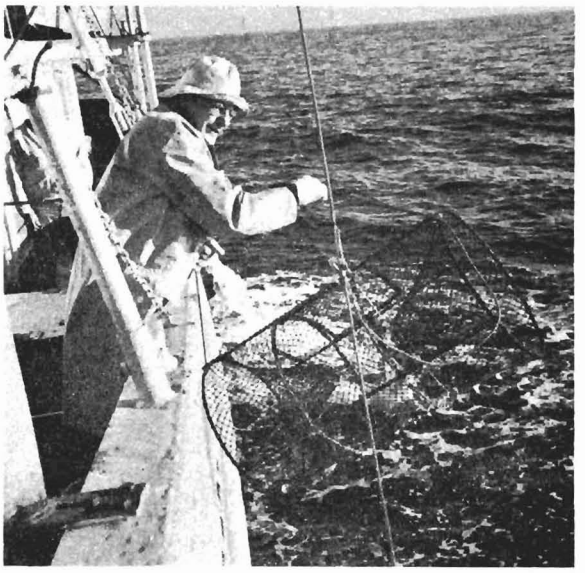
Crab fishing in the San Francisco area has been slightly better than last season, but the outlook for Eureka-Crescent City is not at all bright.

The sardine season ended with the lowest catch (about 1,700 tons) recorded since 1912.

PHOTO HIGHLIGHTS FOR FEBRUARY 1963



Crew of the M/V ALASKA setting an experimental prawn trap.



Retrieving a prawn trap of a different type during the ALASKA cruise.

SAN FRANCISCO BAY AREA STUDY

This study, a cooperative effort on the part of the Delta Study and MRO, is now in full swing. Our phase of the work is being conducted by Al Aplin and will be reported on in the Special Projects section of this report.

The background for and purpose of the study are best expressed in a joint memo by Robert Jones, Leader, Delta Project, and Phil Roedel, Manager, MRO, to the Deputy Director which received his approval on 17 January 1963. The text of the memo reads:

> The waters of San Francisco Bay have in the past years, yielded harvestable resources of considerable magnitude. The oyster, clam, smelt, herring, shrimp, and sportfisheries each alone has been or is now of major consequence. Considered in the aggregate, these fisheries represent a potential harvest of millions of pounds. (Table 1).
>
> The growth of the greater bay area in human population and industrial centers has resulted in reduction in production of what could have been a most valuable area for harvest of marine resources. The potential for production remains. The future economy of the bay area can be enhanced by recognition of and action toward utilization of marine and estuarine environments from Alviso to Crokett.

Table 1

Peak Landings of Selected Species
San Francisco Bay

Species	Pounds	Year
Clam, soft shell	302,000	1919
Herring, Pacific	4,733,000	1918
Oyster, eastern	2,000,000	1916
Shrimp, Bay	3,000,000	1929
Smelt	462,000	1945

The Delta Fish and Wildlife Protection Study, Final Plan December, 1961, discusses the bay and immediate ocean waters in "Problem 7, The Reduction of Outflow to the Sea." There is an urgent need to determine the environmental requirements of fish and shellfish of the bay and adjacent ocean waters so that effects of proposed changes can be evaluated.

The collection of biological information and basic environmental data is necessary if the true values of the bay area are to be obtained.

This information is important to MRO knowledge for assessing value to the bay in relation to extensive dredge and fill operations under way and planned for the bay area. The only report of the area is by Skinner which is rather historical and does not present biological relationships or measures of relative abundance.

The proposed study has been reviewed jointly by our staffs and we recommend commencing it in January 1963.

The area of survey includes waters of San Francisco Bay, San Pablo Bay, and Lower Delta. The vessel used for the joint studies will by the M/V NAUTILUS. It is planned to conduct the first phase of the survey January-December 1963 using ten vessel days each month; approximately five days in south bay areas and five days in upper bays.

Project Personnel from the Delta Fish and Wildlife Study, Stockton, and Marine Resources Operations, Menlo Park, will conduct field and laboratory operations to accomplish the objectives outlined below.

Objectives

I. Determine seasonal distribution and relative abundance of fishes in the estuary.

II. Determine prevailing environmental conditions and define ecological zones in the estuary.

III. Determine food of principle species and its availability.

IV. Relate items II and III to items I.

In general, the objectives are important to both the Delta Project and Marine Resources Operations. The differences in approach relate to emphasis by Delta Project on waters of San Pablo Bay upstream, and particular attention to salmon, striped bass, and shad. MRO has principal concern for information on waters of San Pablo and South bay, and has not selected species for concentrated effort but desires as full a view of all species as possible.

For reasons of manpower available, the south bay waters will receive less intensive study (fewer stations per area) than the environment of principal concern to Delta Project.

The Delta Project is directly concerned with prediction of changes which will occur as the result of proposed water projects. Marine Resources Operations is also, and in addition has responsibilities relating to land fill, dredging and pollution. The methods of survey, similarity of purpose, and availability of the NAUTILUS make this cooperative study expedient and to the advantage of both the Department and the Delta Study.

Your general approval of the cooperative study of San Francisco Bay is requested. Specific assignment of work and financial responsibilities between the two projects will be submitted for your approval following the completion of one or two test cruises to assist in defining work methods and jobs to be accomplished.

S/Robert L. Jones, Leader
Delta Fish and Wildlife Study

S/P. Roedel, Manager
Marine Resources Opetations

1. BOTTOMFISH

A. Flatfish: Landings were rather limited in most areas. Petrale sole were the most abundant fish at Eureka and English sole at other ports. Good fishing for English sole was also reported at Santa Barbara.

California halibut landings were better than usual at Santa Barbara, Avila, and San Francisco. One catch of 11 fish weighing 82 pounds was recorded at Eureka. These fish were 21 to 29 inches long. Additional landings of 2 and 5 halibut each were also reported at Eureka. Commercial landings of California halibut are not the rule as far north as Eureka.

B. Rockfish: Landings were average throughout most of the state. In the Eureka area, a shift in effort to shallower waters increased the catch. The canary rockfish was predominant.

2. SHELLFISH

A. Crab: Landings continue at a low ebb. San Francisco fishermen took one million pounds during November and December.

The average landing for these months since 1950-51 has been 2.9 million pounds, which normally represents 66 percent of a season's landings. Last season 707,000 pounds were landed in the San Francisco area, 86 percent of which was landed in November and December. This is probably the result of scarcity, not decrease in effort. Market demands bring an increase in price (48 cents per pound to fishermen in February) and encourages continued fishing though landings are low.

The scarcity in San Francisco and a high opening price brought a change in fishing effort at Eureka and Crescent City. In 1961-62, 3.1 million pounds were landed at these ports, 55 percent or 1.8 million pounds of this in December. Soft crabs and large San Francisco landings normally keep the December catch at an average of 0.6 million pounds, or 9 percent of the season total. In December of this season, 325,442 pounds were landed. Fishermen reports indicate this is probably the majority of the crabs to be landed.

Tag returns in the Crescent City area continued to be excellent and now exceed the 50 percent mark. This also supports the prognosis of a short, poor season for northern California crab fishermen.

B. Oysters and Clams: Oyster production at Humboldt Bay has leveled off at about 500-600 shucked oyster gallons per day. Production at the other bays also continues good.

Keith Cox has completed about one-half of the oyster seed inspection in Japan. Inspection Commitment forms were received for 10,750 cases. Last season 8,650 cases were packed.

On February 21 Shellfish Investigation personnel conducted a survey of Bolinas Bay to determine the number of oysters on recently abandoned Allotment Number 57.

C. Shrimp: Season closed.

Exploratory prawn fishing was conducted aboard the M/V ALASKA, from January 17 to February 7, from Santa Barbara to Monterey. Three types of traps were fished in locating prawns (Pandalus platyceros) and to determine efficiency of the different gear of different designs. A Gulf of Mexico type shrimp trawl with doors was used to determine its efficiency in catching prawns and ocean shrimp.

Prawn trap fishing from Santa Barbara to Point Buchon did not show promise. Trap fishing in the Monterey region proved productive, with catches up to 7 pounds per trap in 24 hours.

Drags made with the gulf trawl produced more prawns than traps from Santa Barbara to Point Buchon, but catches were not in commercial quantity. Trawling for prawns in Monterey was not productive. Trawling off Avila (Area C) produced catches of ocean shrimp of over 800 pounds of shrimp per hour. The school of shrimp measured 7.5 miles long and averaged 1.1 miles wide.

Samples of prawns and shrimp from all areas were sexed, measured, and weighed for life history studies.

3. PELAGIC FISH

A. Sardines: Only 150 tons were delivered to the southern California canneries and 25 tons, to the markets. Two samples of very large sardines, ranging from 220 to 260 mm standard length (10.2 to 12.0 inches total length) were taken from inshore catches made between Santa Monica Bank and Seal Beach. No sardines were taken in central California.

B. Mackerel: Jack mackerel market landings in southern California totaled 21 tons, and that of Pacifics, 30 tons. Cannery landings through February 16 amounted to 2,000 tons of jacks and 180 tons of Pacifics. Periods of rough weather, plus the temporary closing of one large cannery, held down the catch.

C. Anchovies: Central California cannery landings amounted to 432 tons, including 151 tons landed during the last part of January. This brings the total Monterey area catch since January 1 to 647 tons. Catches have been coming from Monterey Bay and from the area between Point Pinos and Point Sur. Most of the anchovies sampled ranged from 111 to 159 mm in standard length (5.1 to 7.4 inches total length). Only 2 tons were landed at southern California markets.

D. Squid: Southern California market deliveries were 76 tons, with an additional 166 tons landed at Hueneme and trucked to Monterey area canneries. Catches of squid from Monterey Bay were landed for frozen bait and for the fresh fish markets.

E. Live Bait: The demand for bait was light since only a few sport boats are operating at this time of year.

F. Aerial Survey: Due to inclement weather only two days of the five days scheduled were flown. Two unidentified schools were seen, both off Del

Mar. Red tide was quite extensive from Solono Beach, north of San Diego, to Santa Barbara. In places the tide was so heavy that fish schools would not have been visible from the air.

G. Sea Survey: No cruises were scheduled.

Work continued on de-bugging a computor program and on checking past survey data which will be used with it. The program will be run on the 7090 computor at the Western Data Processing Center.

Other activities included taking morphometric measurements from the last of almost 5,000 sardines.

4. TUNA

A. Albacore: The 1962 albacore logbook data have been checked and now are being processed by our computor editing program. Work has continued on the text of our albacore manuscript; two new Fish and Game Seasonal Aids have been appointed to assist in this effort.

There was no fishing activity during the month.

B. Bluefin: One commercial catch of bluefin tuna was landed at Terminal Island during the first part of the month. This is the first catch since September 1962. The fish ranged from 15-60 pounds and were caught off Mexico in January. One of these bluefin had been tagged last summer about 60 miles from where it was recaptured.

We have recovered 86 tags from the 960 bluefin marked last August. This is a 9% recovery and demonstrates that tagging purse-sein caught tuna is practicable.

The 1962 bluefin logbook data have been abstracted and processing by one-degree squares is nearing completion.

C. Miscellaneous: Kenneth Aasen, a Seasonal Aid, is the 100th man to work in our tuna research program since 1951.

Harold Clemens is the only biologist above the I level, other than Parke Young, who has stayed in the project to which he originally was assigned.

5. SPORTFISH

A. Party Boat: Eleven-thousand January fishermen landed 107,000 fish, 20 percent more than did 12,000 1962 fishermen. Major changes by species were:

	1963	1962	Percentage
Barracuda	6,980	2,168	+ 220
Bonito	12,668	14,062	- 10
Calif. Halibut	1,586	3,635	- 57
Kelp, Sand Bass	7,010	3,594	+ 95
Rockfish	66,390	53,138	+ 25

Fishing effort distribution remained about 4.5 to 1, southern California receiving the bulk.

As part of a program to attain greater compliance with regulations governing sportcatch records, preliminary layout sketches and an informal bid for a promotional packet have been forwarded to the Conservation-Education section, requesting their aid.

A local landing operator asked for ideas on how to keep anglers' fish in better condition throughout a long day at sea. With the launching of a new and well-fitted sportboat scheduled for the near future, efforts are being made to handle the catch in a way that it will be in top-notch condition at days-end. Heretofore, sun and heat damage have ruined many fish.

A short paper discussing color anomalies and color changes of the leopard shark is under preparation.

Fish Bulletin 122, The Kelp Bass and Its Fishery, has been sent to the State Printing Office.

B. Ocean Fish Habitat Development (DJ F17R6): Due to stormy sea conditions and time spent overhauling the project boat, diving surveys were not conducted during the month.

Work continued on the project manuscript, which was again submitted for editing.

Turner spent several days working with Sacramento personnel on revisions of the Administrative Manual - SCUBA section.

C. Blue Rockfish Management Study (DJ F19R2): Routine species composition and length frequency collections were made at all ports from Bodega Bay to Avila. Stomach collections were made at Bodega Bay, Monterey, and Avila, and stomach analysis was continued at San Jose State College.

Fishing maps for the area from San Francisco to Moss Landing were edited and are nearing completion. The text for the Monterey and San Luis Obispo county fishing map was submitted for editing.

The skiff was readied for work with new motors mounted and repairs finished.

D. Southern California Marine Sport Fish Survey (DJ F20R1): A year long survey of sport fishing from piers and jetties got off to a scheduled if not 'wet' start on February 1. Despite the rain and random selection of "low use" structures, a few hardy souls were wetting lines as well as themselves. As anticipated, several snags developed however they were dispensed with without interruption of the overall survey. The only major change in the plan required the withdrawal of the San Pedro Breakwater, due to dredging operations, and the substitution of other structures. The complete plan will be written up as a job completion report for submission June 30, 1963.

In brief, the sampling plan incorporates a random selection of and assign-

ment of sampling days and structures - with optimum allocation of time between the stratum of week days and weekend days. Instantaneous counts of fishing poles on each of the four structures examined each sampling day, coupled with three to four hours of interviews of completed fishing trips will yield estimates of total effort, total catch, species catch and catch per unit of effort values. A program to machine process the data was still in the developmental stage at months end.

6. SPECIAL PROJECTS

A. Southern California: The entire month was spent preparing for and conducting an exploratory fishing cruise on the N.B. SCOFIELD (6-25 Febr.). Most of the area we were interested in proved much too rocky to establish trawling stations but good catches of bottomfish were made otter trawling Santa Monica, Santa Barbara Island and San Diego. A number of unusual and interesting specimens were taken in each area with both the otter trawl and midwater trawl.

B. Northern California: Most of the work this month was spent in getting gear ready for the San Francisco Bay Study. Four days were spent fishing. More fish, both as to species and numbers, were found in polluted waters than anticipated. The following were taken south of the Dumbarton Bridge: shad, herring, jack smelt, Sacramento smelt, anchovy, shiner perch, tom cod, sculpin, and striped bass. Bottom dwelling invertebrates collected were bay shrimp, oysters, and several species of clams.

Assistance was given the Delta Study in their first day of fishing in San Pablo Bay.

Aplin, Cecil Martin and Willis Evans (Region 3) attended a meeting in the Oakland office of the State Water Pollution Control Board on April 5, the purpose of which was to review the work being done on San Francisco Bay by the University of California Sanitation Laboratory at Richmond. The laboratory's contract called for a study of the fish in the bay as well as direct evidence of pollution. They had not been too successful so they welcomed the news that the Department of Fish and Game was starting its program.

Their water quality work should coordinate well with our plan, and each agency's collecting vessel would be doing work for which it was best adapted.

On February 8, Aplin met with several members of the staff of the Sanitation Laboratory to discuss details of the operations.

On February 19 Aplin went on the live bait catching boat "Sunbeam 11" from Sausalito to observe operation of their power reel for lampara net pulling.

P.G.&.E has hired Mr. James Adams as a full-time biologist to work at their laboratory in Emeryville. On February 4 Aplin met with Mr. William Cheyney and Mr. Adams to discuss an artificial clam bed planned for Bodega Bay.

7. BIOLOGICAL NOTES

Red Tide

Surface water temperatures in Monterey Bay in February have been the warmest since last October. Daily temperatures taken off Pacific Grove, February 1-23, show an average of 56°F. From about February 10 to near the end of the month, "red tide" made an appearance throughout Monterey Bay. The crew of the otter trawler "St. Mary", working out of Monterey, reported red tide conditions at least as far north as Point Montara. Waves breaking inshore were highly luminous at night. Skindivers reported the red tide blooms to about ten feet below the surface.

Warming of the waters followed a period of southerly winds and heavy rains. It is possible that run- off from the land may have carried certain critical nutrients, such as phosphates, that made conditions favorable for the dinoflagellate blooms. Dr. Abbott of Hopkins Marine Station reports Peridinium and Ceratium predominating, with a scattering of Goniaulax, in one sample of water that was examined.

The appearance of red tide this early in the year in central California waters follows a later than usual lifting of the "mussel poisoning" ban last fall, when the ban was extended from October 31 to December 5.

Red tide is also prevalent off southern California. It was found to be extensive from near San Diego to Santa Barbara during a pelagic fish aerial survey (see monthly report for October, 1962, page 16 for notes on an earlier occurrence.).

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Monterey and San Jose newspapers reported that a green turtle (Chelonia mydas agassizii) was taken in Monterey in the net of the purse seine boat "El Cerrito" on February 1, 1963. The specimen, weighing about 80 pounds, was sold to the Warf Aquarium, Monterey, where it lived in seawater for only a day. Nelson W. Hyler, owner of the aquarium, became suspicious because he had kept an 1,800 pound leatherback turtle, captured in Monterey Bay in August, 1961, for about a month before it succumbed.

Upon further interrogation, the crew of the purse seiner admitted that the turtle had been caught just south of Point Conception, and had been on deck, lying on its ventral surface, for five days before the vessel returned to Monterey.

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Threadfin shad (Dorosoma petenense) have been introduced into many fresh water areas of the state by the Department as a forage fish. Recently they have been reported from ocean waters off Long Beach and at Carquinez Straits in San Francisco Bay.

Further ranging into ocean waters was noted during the January cruise of the M/V NAUTILUS in waters off San Francisco. Threadfin shad were taken at three stations by a modified gulf type shrimp trawl. Two of the stations were within three miles of the mouth of the bay in 6-8 fathoms of water. The third station was at Drakes Bay, twenty-five miles north of San Francisco Bay, in ten fathoms of water. The specimen taken at Drakes Bay was a 121 millimeter (total length) male, apparently in excellent

condition. Several specimens were taken at the other stations but not saved.

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A slickhead (Alepocephalus tenebrosus) was caught by the trawler INA off Redding Rock and brought to the laboratory for identification.

8. BIOSTATISTICS

A. Data Processing

Regular Reports:

The statistical reports of December 1962 landings were completed.

The marine sport catch reports were prepared from January 1963 party boat logs.

The marine sport catch letter, summarizing the January catch, was prepared and mailed.

January 1963 processor and cannery reports were tabulated. Tuna and sardine letters, which summarize the January cannery production, were prepared from the reports and mailed.

The 1962 annual salmon report, No. III, was prepared and forwarded.

Special Reports:

Lake Tahoe creel census reports for 1962 were tabulated for the Lake Tahoe Fisheries Study.

A report showing San Diego area landings and shipments for 1962 was prepared for the San Diego County Department of Agriculture.

The 1961 and 1962 commercial fish landings at Ft. Bragg were tabulated for the Noyo Harbor Commission.

A special report of sardine landings for the 1959-1962 seasons was prepared for Pelagic Fish Investigations.

Work in Progress:

January and February 1963 market and cannery receipts are being edited.

Trawler receipts for December 1962 and January 1963 are being edited.

A fishery for miscellaneous species of mollusks and crustaceans has been in existence for many years. These were used by sport fishermen for bait. This past year we actively tried to obtain records on this resource. An editing and report-tabulating procedure to document this fishery is being formulated.

Work has started on the 1962 annual statistical circular. This report is to be published in June.

B. Technical Assistance and Biometrical Analysis

Statistical and Mathematical Analysis:

The manuscript describing the past card angling effort survey was revised.

A paper describing the salmon sampling program was discussed with Paul Jensen of the Salmon Project.

Computers:

A program was written to fit the von Bertalanffy growth curve to rockfish age and length data. This program is now in the testing stage.

A program to handle the data arising from the sample survey of southern California sport fishing is being written. We expect the computer to provide 1,500 to 2,500 distinct non-zero estimates of catch, catch/unit effort, length of fishing day, etc., since 100+ species will be separately enumerated on about 40 piers and jetties.

9. RESEARCH VESSELS

N. B. SCOFIELD

The vessel conducted a 20 day exploratory cruise (63-1-S) off the southern California coast and Channel Islands.

ALASKA

On the 7th the vessel returned to San Pedro from a 3 week shrimp and prawn study off central California (cruise 63-1-A).

The balance of the month the vessel was secured for CTO and maintenance.

NAUTILUS

The NAUTILUS conducted one 5 day crab cruise off San Francisco Bay, a two day salmon study in San Francisco Bay and ten (10) days on the San Francisco Bay Study.

The vessel secured at Redwood City on the 22nd for CTO and maintenance.

MOLLUSK

Secured at Berth 56, San Pedro.

10. MISCELLANEOUS

A. Meetings, Talks and Visitors

Jan. 29 - Best met with Mr. Thomas J. Murray, a private economic consultant, to discuss fisheries off Crescent City.

Feb. 1-2 - Nitsos attended a meeting of the Wildlife Society at Sacramento State College.

Feb. 2 - Burton presented a paper on electrophoresis techniques at the Wildlife Society Meeting in Sacramento.

Feb. 4-8 - Radovich spent the week in Sacramento headquarters assisting the Acting Marine Resources Branch Chief.

Feb. 6 - Ebert gave an illustrated talk on project work to the VENTURA COUNTY KELP CATS Diving Club; 30 attendees.

Feb. 7-14 - Roedel participated in the wardens training school in San Francisco.

Feb. 14 - Petrich, Heimann, and Mais met with Mr. Hayhurst at Scripps to discuss the installation of a precision depth recorder.

Feb. 16 - Best gave a lecture on identification of commercial fishes to fifty wardens at semi-annual training class held in San Francisco.

Feb. 18 - Radovich and Roedel met with Drs. Ahlstrom and Schaefer at La Jolla to discuss Point Arguello work plans.

Feb. 18 - Gates met with Charles Carry of the California Fish Canners Association to discuss the fisheries of Chile.

Feb. 22 - Young and Ebert attended an annual meeting of the Southwest Anglers Button Award Association where about 200 delegates were assembled. The Association recently added the cow rockfish, S. levis, to the button list, and asked the Department to officially recognize the existence of the species in the presence of the delegates. Fish Bulletin 104, A Review of the Rockfishes of California, was presented as documentary authority.

B. Personnel:

Jan. 31 - Richard Wood, appointed Marine Biologist II, Pelagic Fish Investigations.

Feb. 1 - Lutie Humphrey, appointed Intermediate Account Clerk, Biostatistics.

Feb. 4 - Kathleen Woodall, appointed Junior Stenographer.

John E. Fitch
Acting Manager

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